

**Making the Business Model Shift
From Cow / Calf to Finishing**

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I've had a cow herd for years and think I want to feed my own calves. Now what?

The purpose of this article is to address issues and points of consideration for cow-calf producers who have limited experience in feeding cattle to harvest but are considering changing their business model. There are a lot of excellent cattlemen who have been very successful with a cow-calf operation but have never fed cattle to harvest – except a few for locker beef.

There are many good reasons for feeding out one's own calf crop (e.g. using manure for improving soil fertility and reducing commercial fertilizer, improving the value of one's cattle, optimizing use of labor supply, creating a means of expanding your business to carve out another income for a family member, etc.). Building a confinement cattle-feeding facility is a good way to improve manure value, enhance predictability of cattle performance, and overcome many of the environmental challenges of feeding cattle in the Corn Belt.

There are some important differences, however, in the cow-calf sector and the feeding sector of the industry. Management of a cow-calf herd is more "event" centered (calving season, breeding season, weaning, etc.) whereas feedlot management is more a daily routine – consistency and regularity is critical to feedlot management. Cow diets are based on forage and the management of feed delivery is very forgiving. Even supplementation can be provided on an every other day basis. But finishing cattle is different! Cattle fed high-energy diets – particularly more starch (grain) – need to be offered feed frequently (minimum 1 time/day) and consistently (same amount and same time of day). The "hotter" the ration, the more critical feeding management becomes to keeping cattle "on feed" and optimizing dry matter intake and hence daily gain.

Starting cattle on feed:

Nutritionists and feed companies often differentiate themselves in the strategies they employ to bring cattle up to full feed. The number of rations, the starting ration energy level, the incremental differences in energy level between rations, and how long each ration is fed to a weight class of cattle are common differences. Some nutritionists use intake modifying ingredients to limit or control intake during this process. A very successful method to start cattle on feed involves scripting or programming the amount of feed delivered daily for the first 2-3 weeks.

In the normal fermentation process, volatile fatty acids are produced in the rumen and subsequently used for energy by the animal. The more highly digestible the ration, the more volatile fatty acids are produced in the rumen. That is a good thing. More volatile fatty acids mean more energy, more energy means more gain. But sudden ration changes, especially large increases in fermentable carbohydrates (e.g. grain) can create imbalances in acid production and utilization.

One of the goals in starting cattle on feed is to "*not teach*" them to "*not eat*". Have you ever gotten sick from eating too much of a favorite dessert? Cattle learn avoidance when they have bouts with acidosis or digestive disturbances. If they feel good, they will naturally eat. Cattle do not need to be taught to eat. But they can be taught to "*not eat*". Scripting intake is a great way to insure adequate, but not excessive, intake when starting stressed cattle and bringing them to full appetite in an orderly manner.

The method one chooses to start cattle will depend largely on the working relationship with their nutritionist, the feedstuffs one has available (i.e. digestible-fiber based ingredients vs. starch sources like corn, barley,

wheat, etc.; wet ingredients like silage and/or by-products vs. dry feeds), and the program that fits your management style and comfort level.

On-feed management:

Feeders need to use total mixed rations and invest in a mixer with a scale. Feeding cattle by layering feed in an old style silage box wagon and estimating amounts of feed by volume costs the feeder efficiency. Several years ago, SDSU conducted a study showing the value of a mixer wagon with scales. One replication was fed by volume and one replication was fed with a mixer wagon with scales. At that time, using current costs and the performance differences in the cattle due to the feeding method, it took only feeding 114 head of cattle to justify purchasing a used mixer wagon in good condition.

Managing cattle to prevent bouts with acidosis and “going off feed” is an important skill to develop. Cattle do not have a finely tuned mechanism to control their appetite. The biological feedback systems are not as precise and as quickly implemented as an operator monitoring the fermentation of an ethanol plant. Cattle feeders don’t have the luxury of operating a fermentation plant with gauges and flow meters. We have the added challenge of an animal with changing appetite and changing responses to environmental conditions.

Rations should be formulated on a *fixed percentage basis*. That can be a hard adjustment for the cow-calf producer who is used to thinking in terms of how many pounds to feed their cattle each day. But remember, feedlot animals on high energy rations are at greater risk for digestive upsets than cows and developing calves fed forage based diets. So keeping ingredients locked in the same proportion (fixed %) each day is critical.

Too often, when changing the amount of feed offered based on appetite changes, cattlemen fluctuate only one ingredient while leaving others constant. This change in ingredient proportions changes the rate of fermentation and the energy content of the ration. Feeders who think in terms of feeding “x” pounds of supplement wind up feeding higher concentrations of ionophores when feed intake is decreased. This is just the opposite one wants. When one fluctuates the pounds of corn or roughage fed each day, the fermentability and energy content of the ration changes. It is more important to understand differences in the rate of fermentation of various feeds than the actual energy content to keep the rumen in as near steady state as possible.

Bunks should be “read” daily and a feed call made to determine how much feed is offered that day. Most nutritionists will suggest managing bunks so feed is cleaned up or only crumbs are left. One does not want to put so much feed in the bunk that it is essentially a self-feeder! The point is to manage intake so it is consistent. A small incremental change to keep cattle from taking a “charge” of feed is important. One of the most important tools in managing bunks is keeping a record of how much feed was offered each day for the previous couple of weeks as a reference. Better yet, using a bunk scoring technique adds another dimension to accurately making a bunk call. See your nutritionist for more details on how he wants you to “read” bunks.

One needs to be cautious of increasing feed offered as storm fronts develop. Barometric pressure affects voluntary intake. Cattle instinctively eat more to prepare for a storm, but grazing cattle consume lower energy, high fiber forages. Cattle on finishing rations are already consuming the maximum amount from which they can handle the acid load produced in the rumen. If one increases intake of a high energy finishing ration as barometric pressure changes, too much acid is produced and then intake often “crashes” a few days later.

When transitioning cattle from a growing ration to a finishing ration, intermediate energy rations are often formulated. These rations are usually only fed for a short time. It is important to formulate enough rations with small enough incremental increases in energy so cattle transition to the high energy finishing ration without digestive disturbance. Some feeders make ration changes on the second feeding of the day since there are usually fewer hours between the morning and afternoon feeding than between the afternoon and next mornings' feeding. Hence, cattle have less appetite and are less aggressive coming to the bunk.

A common error in feeding cattle is not having an appreciation for differences in dry matter content of ingredients and rations. Cattle tend to eat a consistent amount of dry matter. But ingredients can vary tremendously in their dry matter content and so the amount of as-fed feed one must deliver to provide the same amount of dry matter can change dramatically. Also, when an ingredient is substituted for one with a different dry matter content, the proportions of feedstuffs in the ration change significantly to keep the same energy concentration. Often producers make abrupt changes in energy content of diets because they do not appreciate moisture differences between ingredients. Always call your nutritionist to calculate new rations when changing the ingredients used in a ration.

Rations should be delivered uniformly throughout the length of the bunk. It is a skill to learn how fast to drive and how wide to open the spout to prevent backing up and making repeated trips. Too often feeders will "wad" feed at one end of the bunk – they deliver what they made the feed call for, but it is all in one 8' section of the bunk! That means another section bunk is lacking in feed. This can lead to some cattle not getting as much feed as they need and others overfilling, especially if bunk space is marginal.

Efficiency before the feed bunk:

Feed storage losses can be huge! Attention to operational details and efficiencies are critical to success. We often think of maximizing efficiency in biological terms related to animal and nutritional management and thereby minimizing the pounds of feed required for a pound of gain. We think about management practices like implant regime, properly balanced rations, animal health and animal comfort (bedding, less mud), etc. But efficiency is more than animal efficiency.

Silage is a great feed, but if not packed properly, the dry matter losses from fermentation can be excessive. If you can see tire tracks when you are done packing the bunker silo, you have a problem – and that is common. Very well packed silage has a minimum 10% shrink (Table 1). Table 2 shows the typical range in storage losses of corn silage in various structures.

Density Lb. DM./ft ³	DM Loss at 180 days %
10	20.2
14	16.8
15	15.9
16	15.1
18	13.4
22	10.0
Ruppel, 1992	

Type of Structure	Storage Losses
Stack or pile, uncovered	20-40%
Stack or pile, covered	15-35%
Trench or bunker, uncovered	12-25%
Trench or bunker, covered	8-20%
Bags	6-15%
Upright silo	8-15%
Iowa Beef Center	

If one assumes an average of 3 tons of silage fed to a steer through the growing and finishing phase, a value of \$50/ton of silage, and improved ensiling management saves 20% of silage DM, this equates to \$30.00/animal difference in profitability (50 x 3 x 20%).

Storage method affects shrink of dry feed ingredients considerably as well. Good bulk bins can pay for themselves. Information gathered by the Iowa Beef Center reports the typical shrink on dry feed ingredients are 2-5% from bulk bins, 5-10% with commodity sheds, and 15-20% in open piles.

Wildlife, birds, and rodents cause more loss than one realizes (Table 3). Starlings can consume 1.8 lb. of grain/month (0.06 lb./d x 30 d). That may not sound like much. But 10,000 starlings consume 18,000 lb./mo and that equates to 321 bu. of corn and \$1,284/mo at 4.00/bu.

The saying goes, “if you see one rat, there are a thousand”. One thousand rats will consume 32 bu/month [(0.06 x 1,000, x 300/56)]. And that does not include what they contaminate and the disease risk. Feed spillage and weed growth around feed bunks invite rats to take up residence.

Animal	Grain Consumption (As-fed lb./day)
Norway rat	0.06
Deer	0.50
Raccoons	0.41
Pigeon	0.08
Starlings	0.06
Redwing Black	0.02
Adapted from Besser et al. (1968) and Cooper et al. (2006) Reported by Jaderborg and DiConstanzo. MN Nutrition Conference 2012	

The above data and calculations demonstrate the value of good feed storage facilities and management. Bulk bins and commodity storage with a roof and concrete floor pay for themselves very quickly. If you invest in a

good feeding barn, also be sure to invest in good feed storage. It is not hard to realize several thousand dollars loss in annual feed costs in a 500 head feedlot before it is ever placed in a mixer wagon.

If you choose to custom feed a few cattle along with your own, feed storage and shrink will mean the difference between a profitable venture and a failed one.

Managing the elements:

One of the biggest challenges to feeding cattle in the Corn Belt is dealing with the environmental impact on performance. Rainfall and evaporation is entirely different in the Corn Belt compared to the High Plains. Traditional farmer-feeders in the Midwest have dealt with mud, snow, and extreme cold weather in the winter. This dramatically affects daily gain and feed conversion and can make predictability of harvest date difficult, let alone wreaking havoc with expected cost of gain. Cattle do well when they are dry and out of the wind even in the coldest of winters.

Confined feeding facilities can bring predictability to performance. This assumes that in deep bedded barns there is adequate square footage per animal, pens are scraped behind the bunk routinely and on a timely basis, and the bed pack is properly maintained so cattle are comfortable. A telltale sign that one of these factors is awry is cattle with a lot of “tag” – balls of manure hanging on their hide. When there is adequate square footage, pens are maintained properly and there is adequate ventilation, cattle will have minimal manure on them.

Buyers will also like the cattle from well-managed confinement barns because they will dress better. Dressing percentage is the percentage of carcass weight vs. live weight. Cattle with excessive “tag” on their hide have a lower dressing percentage. It only takes 14 lb. of manure hanging on the hide of a 1400 lb. steer to affect dressing percentage by one point.

There is peace of mind in the “once-in-ten-years” winter that cattle will continue to gain and convert as expected because the environment is consistent and comfortable for the cattle. When you place cattle in a properly managed confinement facility and the nutritionist makes a profit-loss projection, there are few surprises due to poor performance caused by inclement weather. This added predictability allows for implementing marketing strategies of the finished cattle in the proper month.

Many feeders feel they benefit more from confined feeding facilities in the summer than they do in the winter. Shade and a good bed pack help keep cattle cool and comfortable. When fat cattle die from extreme heat conditions, producers often do not recognize the amount of heat radiated from open lots with black soil. Bedding can be as important in the summer as in the winter.

Obtaining *individual* carcass information:

A critical component to improving the value of your cattle is to obtain *individual* carcass information on each animal. You should insist on this! From individual carcass information one can calculate the actual value and determine the “return to ranch income” for each calf (tied back to the dam). This is a simple calculation to make using a spreadsheet. You may have cows that produce acceptable calves at weaning, but if their calves have standard grade carcasses, they need to leave the ranch. Other calves grow well to weaning, but do not perform well in the feedlot. Knowing the individual carcass weight, rib eye area, fat thickness, marbling score,

and quality grade will give you the information on which cows to cull as well as what selection emphasis you need when purchasing bulls. Several producers who have been retaining ownership of their calves and getting carcass and feedlot performance data back have improved the value of their cattle by over \$200.00/head.

Hidden advantages to cow herd management:

As a producer changes their business model from selling feeder cattle to feeding cattle to harvest, there are opportunities to gain from certain management practices that would not have been evident previously. Measuring your success on a calf's lifetime performance and carcass value brings aspects of cow nutrition into sharper focus.

In the last few years, research has demonstrated how cow nutrition during pregnancy can affect the performance of calves born from that pregnancy. The University of Nebraska demonstrated that nutritional supplementation of cows in late gestation affected the percentage of steers that graded choice from that pregnancy (Funston et al. 2009 Nebraska Beef Cattle Report).

In another study, improved cow nutrition during late lactation-mid gestation affected feedlot performance and quality of carcasses from steer calves born from that pregnancy. Cows were managed as one group except for 60 days during mid-gestation when they were pastured on either native range or improved grass (quality of diet was verified by esophageal extrusa samples). The calf crop was managed as one group. Calves from cows grazing improved pasture for 60 days in mid-gestation had 0.4 lb. higher daily gain ($P < 0.05$) in the finishing phase, had 39 lb. heavier hot carcass weights ($P < .01$), tended to have more marbling ($P = .12$), had numerically larger rib eye area, and had significantly more tender steaks as measured by shear force ($P = .004$). These differences are easily understood by looking at the time frame when muscle and fat cells are being developed *in utero*.

This area of research on fetal or developmental programming that studies nutritional effects on performance of the subsequent calf crop is very active and one of the most exciting developments in recent years in the opinion of this author. Paying closer attention to cow nutrition will pay dividends in feedlot performance and carcass value of the calf crop and can be realized by the producer when he feeds out his own calves to harvest.

Further, one may also want to rethink the timing of the calving season and evaluate it from a total systems approach. When selling calves as feeders, one usually thinks in terms of matching stage of production with forage availability and quality such that cow supplemental nutrition is minimized and cost of inputs is minimized. However, timing the sale of finished cattle in the spring can bring huge returns in total revenue. It is not uncommon for the live cattle market to vary \$20/cwt or more from the typical high in the spring to the typical low in summer. Fifteen dollars per hundredweight on a 1400 lb. animal is \$280/head more revenue. Developing a production system that keeps input costs in line, yet allows for more optimal marketing of finished cattle can make a tremendous difference in profitability.

Expected services of a nutrition supplier:

Obviously the first and foremost service is reliable delivery of feed supplement manufactured and formulated properly and delivered in a timely manner. Additionally, your supplier should be able to provide the following *technical services*:

- Feed analysis and ration mix monitoring (cost of this service will vary by supplier)

- Computer balanced rations expressed on a fixed percentage basis
- Batch sheets for mixing rations
- Comparative value of feedstuffs available for purchase (evaluate the value of by-products)
- Tracking service (calculate current weight, performance, and break-even)
- Feedlot audit and walk-through on an agreed upon schedule (cattle need to be observed)

Tracking is an important on-feed monitoring tool. One can spot potential issues developing as cattle are being fed and avoid surprises. When genetic potential is properly described, all costs associated with a group of cattle are inputted (purchase weight and price, processing costs, trucking, etc.), and total feed deliveries for a period of time are recorded, current in-lot weight, daily gain, feed conversion, break-even and other factors can be calculated. To do this properly requires good cooperation and information flow between the feeder and the nutritionist/feed supplier. Over time, a history of closeouts can benchmark performance. From this a person has information evaluate themselves and from which to consider the merits of a new or altered management practice. The nutritionist or feed supplier should be able to supply a basic tracking program and service to farmer-feeders.

Feeding home raised cattle to harvest can be a profitable enterprise. There is a learning curve to the nutritional management, but it is easily climbed by paying attention to details. Constructing and managing a well-designed building can be an integral component of implementing a successful cattle-feeding enterprise.

Remember, you are not just raising cattle. You are in the food business. You are producing beef that is going to be on someone's dinner plate – maybe even your own. Being a part of feeding the world is a worthy endeavor.